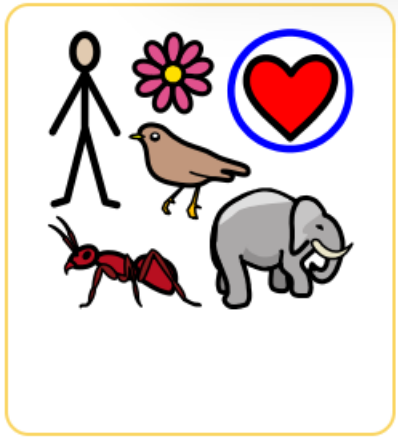
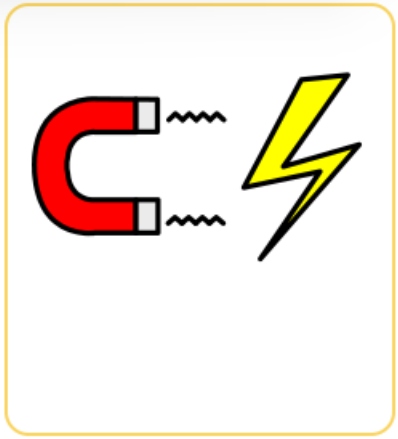
At Owston Park Primary Academy, our Science curriculum is organised around the key substantive concepts of Living Things, Materials and Matter, Forces and Energy, and Earth and Space. These concepts provide a framework through which pupils develop a coherent understanding of the natural world, making connections between scientific ideas studied throughout the curriculum. Pupils learn how living organisms grow, survive and interact with their environments, how materials can be identified, classified and changed, how forces and energy cause movement and change, and how the Earth and wider universe function. These concepts are carefully sequenced, revisited and deepened over time, enabling pupils to build secure and connected scientific knowledge.
Alongside this, pupils develop their disciplinary knowledge through Working Scientifically Skills, learning to ask questions, make predictions, set up tests, observe and measure, record data, interpret and communicate results, and evaluate their findings. Through these processes, pupils learn to think and work as scientists by investigating ideas, analysing evidence and drawing informed conclusions.



Living Things:
How living organisms grow, survive, reproduce, adapt and interact with their environment.



Materials & Matter:
How materials are identified, classified, changed and used.



Forces & Energy:
How forces, light, sound and electricity cause movement, change and interactions in the world around us.



Earth & Space
How the Earth, weather, seasons and wider universe work.

Knowledge Progression – Science

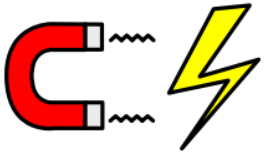
	Key Concepts Covered	Vocabulary	Substantive Knowledge	Disciplinary Knowledge
EYFS	Living Things, Materials & Matter, Forces & Energy, Earth & Space	animal, plant, tree, flower, leaf, living, grow, change, material, wood, metal, plastic, glass, hard, soft, push, pull, float, sink, weather, season, rain, sun	Children explore the natural world through observation, play and first-hand experiences. They begin to recognise and describe plants, animals, weather and seasonal changes. Through investigation and exploration, children develop an awareness of everyday materials and their properties and begin to understand that objects can move and change in different ways. They learn about similarities, differences, patterns and change within the world around them.	Observe and explore the natural world using their senses. Ask simple questions about how things work and why things happen. Notice similarities, differences, patterns and change. Make simple predictions about what might happen. Investigate materials, objects, plants and animals through play and exploration. Use simple vocabulary to describe what they see, hear, feel and observe. Share their ideas and observations through talk, drawings and practical experiences.
Y1	Autumn: This is Me - Living Things Spring: Seaons - Earth & Space. Animals incl. Humans – Living Things Summer: Everyday Materials – Materials & Matter	absorbent, amphibian, animal, bird, carnivore, change, deciduous, evergreen, fish, flower, habitat, hearing, herbivore, human, invertebrate, leaf, mammal, material, omnivore, opaque, reptile, root, season, sight, smell, soft, stem, taste, touch, translucent, transparent, waterproof	Children know that humans are living things that grow and change and have body parts with specific functions. They know that humans use five senses to gather information about the world and that healthy lifestyles help us stay well. They understand that weather changes across the four seasons and that seasonal changes affect plants, animals and day length. They know that animals can be classified into groups and further categorised as carnivores, herbivores or omnivores. They know that plants include deciduous and evergreen trees and have basic structures including roots, stems, leaves and flowers with specific functions. They know that everyday objects are made from different materials and that materials can be identified, compared and grouped according to their properties and suitability for different uses.	Ask simple scientific questions about the world around them. Make simple predictions based on prior knowledge and observations. Participate in setting up simple comparative tests. Observe closely using their senses and make simple measurements. Gather, record and sort data using pictures, charts and tables. Identify patterns and use observations to answer questions. Begin to evaluate investigations and suggest ways tests could be improved.

Y2	Autumn: Materials – Materials & Matter, Polar Animals – Living Things Spring: Plants – Living Things Summer: Coastal Habitats – Living Things	absorbent, adaptation, algae, aquatic, bulb, consumer, degrees Celsius, dispersal, edible, endangered, flexible, flowering, food chain, germination, global warming, habitat, life cycle, man-made, microhabitat, natural, nutrients, offspring, opaque, predator, prey, producer, properties, purpose, recyclable, reproduce, rigid, rock pool, shelter, shoot, survive, transparent, waterproof	Children know that materials have different properties which make them suitable for particular purposes and that materials can be natural or man-made, recyclable and capable of changing shape. They understand that living things depend on habitats to meet their needs and that animals and plants are adapted to survive in different environments. They know that food chains show how energy passes between living things and that changes to habitats can affect entire ecosystems. They understand that plants are living things that grow, reproduce and have life cycles, requiring water, light, nutrients, air and warmth to survive. They know that plants and animals can be suited to specific habitats and that humans have a responsibility to care for environments and wildlife.	Ask relevant scientific questions and use simple scientific language to explain their ideas. Make predictions based on observations and prior learning. Begin to understand and carry out fair tests. Observe changes over time and measure using standard units and simple equipment. Record findings using tally charts, tables and simple diagrams. Identify patterns and relationships in data and use evidence to answer scientific questions. Draw simple conclusions and evaluate the effectiveness of investigations and tests.
Y3	Autumn: Muscles & Skeletons - Living Things Rocks – Materials & Matter Spring: Plants – Living Things Summer: Forces – Forces & Energy. Light – Forces & Energy	absorb, angle, attract, backbone, bedrock, bones, contrast, dark, decaying, dispersed, emits, endoskeleton, exoskeleton, force, friction, germination, gravity, igneous, joints, life cycle, light, magnetic field, magma, metamorphic, mineral, mirror, motion, muscles, opaque, opposite, organs, permeable, pollen, properties, pull, push, reflects, reflection, relax, resistance, rock, sediment, shadow, skeleton, soil, source, stigma, surface, tendons, torch, transported, translucent, transparent, vegetation, vertebrate, weathered	Children understand that animals, including humans, need nutrition and that muscles and skeletons work together to provide support, protection and movement. They know that plants have specialised structures and life cycles, requiring specific conditions for growth and reproduction. They understand that rocks can be classified according to their properties and formation, that fossils provide evidence of ancient life and that soils are formed from rocks and organic matter. They know that forces affect how objects move and that some forces require contact whilst others, such as magnetism, can act at a distance. They understand that light is needed in order to see, that light reflects from surfaces and that shadows are formed when light is blocked by opaque objects.	Ask relevant scientific questions based on prior knowledge and observations. Make sensible predictions and begin to justify them. Plan and set up fair tests using appropriate equipment. Make systematic observations and take measurements using standard units. Present findings using charts, tables, diagrams and graphs. Use evidence to identify patterns, draw conclusions and answer scientific questions. Evaluate investigations and suggest improvements to methods and reliability.
Y4	Autumn: Classification – Living Things. Teeth and Digestion – Living Things	amplitude, battery, buzzer, canine, carnivore, circuit, classification key, component, conductor, condensation, cooling, current, decay, digestion,	Children understand that living things can be classified according to their characteristics and habitats, and that classification keys can be used to identify organisms. They know that all living things carry out life processes	Ask relevant scientific questions and use different types of enquiry to answer them.

	Spring – States of Matter – Materials & Matter Summer: Electricity – Forces & Energy. Sound – Forces & Energy	electricity, enamel, energy, evaporation, excretion, food chain, frequency, freezing, gas, habitat, heating, herbivore, insulator, intestines, invertebrate, liquid, medium, molar, nutrition, omnivore, organism, particle, pitch, precipitation, pre-molar, reproduction, respiration, sensitivity, solid, sound waves, source, switch, transmit, vertebrate, vibrations, volume	and that habitats can change due to natural and human influences. They understand the structure and function of the digestive system and how teeth are adapted for different diets. They know that materials exist as solids, liquids and gases and that heating and cooling can cause changes of state. They understand the processes of evaporation, condensation and precipitation within the water cycle. They know that electricity is a form of energy that flows through complete circuits and that materials can be electrical conductors or insulators. They understand that sound is produced by vibrations, travels through different media and can vary in pitch and volume.	Make predictions and suggest what may happen if variables are changed. Set up comparative and fair tests independently. Make systematic observations and accurate measurements using a range of equipment, including thermometers and data loggers. Gather, record, classify and present data in a variety of ways. Use evidence to draw conclusions, identify patterns and support scientific explanations. Evaluate enquiries, suggest improvements and raise further scientific questions.
Y5	Autumn: Reproduction and Life Cycles – Living Things Spring: Forces – Forces and Energy, Materials – Materials and Matter Summer: Space – Earth & Space	adolescence, adulthood, air resistance, amphibian, attract, balance, condensation, contact force, development, dissolve, embryo, evaporation, fertilisation, force, friction, fulcrum, gestation, gravity, hormones, irreversible change, life cycle, magnet, magnetic field, matter, menstruation, metamorphosis, motion, Newtons, offspring, orbit, planet, puberty, pulley, reproduction, resistance, reversible change, rotate, solar system, solution, solvent, sperm, universe, vertebrate, water resistance, zygote	Children understand that all living things reproduce and have life cycles, but that these vary between plants, animals and humans. They know the differences between sexual and asexual reproduction and understand the processes of pollination and fertilisation. They understand the stages of human development and the physical changes associated with puberty. They know that forces affect motion and that gravity, friction, air resistance and water resistance act on objects in different ways. They understand the difference between balanced and unbalanced forces and recognise how mechanisms such as levers and pulleys allow smaller forces to have a greater effect. They know that materials can be grouped according to their properties and that some materials dissolve to form solutions. They understand reversible and irreversible changes and how mixtures can be separated using different processes. They know that the solar system consists of the Sun and eight planets,	Ask relevant scientific questions and select appropriate enquiry types. Make reasoned predictions using scientific knowledge and evidence. Plan and carry out comparative and fair tests independently. Take accurate measurements using a range of scientific equipment and record results systematically. Present findings using tables, graphs, diagrams and scientific models. Use evidence to identify patterns, support conclusions and explain results. Evaluate investigations critically, identifying anomalies, limitations and possible improvements.

			that the Earth and Moon move in predictable patterns and that gravity plays a key role in keeping celestial bodies in orbit.	
Y6	Autumn: Electricity – Forces and Energy. Classification - Living Things Spring: Animals incl. Humans – Living Things Summer: Light – Forces and Energy. Inheritance and Evolution – Living Things	adaptation, ammeter, artery, atrium, bacteria, blood vessel, capillary, cell, circuit, circulatory system, classification, component, conductor, current, ecosystem, electricity, endoskeleton, evolution, exoskeleton, family, fungi, genus, inherit, insulator, kingdom, microorganism, motor, nutrient, opaque, organ, oxygenated blood, phylum, prism, pulse, reflection, refraction, respiration, series circuit, species, spectrum, switch, taxonomy, vein, ventricle, vertebrate, voltage	Children understand that scientists classify living things according to shared characteristics and that classification systems help us identify and study organisms. They know that inherited characteristics are passed from parents to offspring and that adaptation and natural selection contribute to evolution over time. They understand that fossils provide evidence for how life on Earth has changed over millions of years. They know the structure and function of the human circulatory system and understand how nutrients, oxygen and water are transported around the body. They recognise the impact of lifestyle choices on health and wellbeing. They understand that electricity can be controlled within circuits and that changes to components affect their performance. They know that light travels in straight lines, is reflected into our eyes and can be reflected and refracted by different materials. They understand how shadows are formed and how white light can be separated into the visible spectrum.	Ask increasingly complex scientific questions and select appropriate enquiry methods independently. Make reasoned predictions using prior scientific knowledge and evidence. Plan and carry out fair tests, identifying and controlling variables. Take accurate measurements and observations using a range of scientific equipment. Record findings using tables, graphs, diagrams, classification keys and branching databases. Analyse patterns, identify relationships and use evidence to justify conclusions. Evaluate investigations critically, considering reliability, anomalies, limitations and improvements.

Concept development over time

Key Focus	 Living Things	 Materials & Matter	 Forces & Energy	 Earth & Space
EYFS	Children begin to notice, observe and talk about animals, plants and the natural world around them.	Children begin to explore and describe the properties of everyday materials through play and investigation.	Children begin to explore how objects move and change through pushing, pulling, rolling, building and observing.	Children begin to observe seasonal change, weather patterns and the environment around them.

Knowledge Progression – Science

Y1 – Autumn - This Is Me	Body parts, senses, growth, health and the basic needs of humans.			
Y1 – Spring - Seasons & Animals incl. Humans	How seasonal changes affect plants and animals. Plant structure, classification and basic functions.			Weather patterns, seasons and changes throughout the year.
Y1 – Summer - Everyday Materials		Identifying, comparing and describing materials and their properties.		
Y2 – Autumn - Materials, Polar Animals	Habitats, food chains, adaptations, survival and life cycles.	Identifying, testing and comparing materials according to their properties and uses.		
Y2 – Spring - Plants	Plant growth, reproduction, life cycles and survival.			
Y2 – Summer - Coastal Habitats	Habitats, microhabitats, adaptation and environmental impact.			
Y3 – Autumn - Muscles & Skeletons, Rocks	Nutrition, skeletons, muscles, movement and animal survival.	Rock formation, fossils, soil and classification according to properties.		
Y3 – Spring - Plants	Plant structure, reproduction, water transportation and life cycles.			
Y3 – Summer - Magnets, Light			Pushes, pulls, friction, magnatism and movement. Light sources, reflection, shadows and how we see objects.	
Y4 – Autumn – Classification, Teeth & Digestion	Classification, life processes, habitats and food chains.			

	Digestion, teeth, nutrition and food chains.			
Y4 – Spring – States of Matter		Solids, liquids and gases. Particle behaviour and changes of state.		
Y4 – Summer – Electricity, Sound			Circuits, electrical energy, conductors and insulators. Vibrations, sound waves, pitch, volume and how sound travels.	
Y5 – Autumn – Reproduction, Life Cycles	Reproduction, life cycles, puberty, plant reproduction and human development.			
Y5 – Spring – Forces, Materials			Gravity, friction, air resistance, water resistance and mechanisms.	
Y5 – Summer - Space			Gravity and orbital movement	The solar system, planetary movement, day and night and the Moon.
Y6 – Autumn – Electricity, Classification	Classification, taxonomy, microorganisms and ecosystems.		Circuits, voltage, electrical output and circuit symbols.	
Y6 – Spring – Animals incl. Humans	Circulatory system and the impact of lifestyle choices on health.			
Y6 – Summer – Light, Inheritance & Evolution	Evolution, adaptation, inheritance and natural selection.		Reflection, refraction, shadows, the visible spectrum and how we see objects.	